# SERVICE BULLETIN

MITSUBISHI MOTORS

GLOBAL AFTER SALES OFFICE, MITSUBISHI MOTORS CORPORATION

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| PURPOSE : CHANGE | ISSUE NO. : MSB-13EXML54-005 | DATE : 2013-12-12 |
| SUBJECT : ADDITIONAL TROUBLE SHOOTING OF THE TRACTION BATTERY ENERGY LEVEL GAUGE | | <DESTINATION/MODEL> (MMNA/USTP/EUR/MMAL/ NZ) <M/Y> 11-14 |
| GROUP : POWER UNIT & TRACTION BATTERY(Gr:54D) | | i-MiEV(HA3W) |

## 1. Description :

Please refer to the attached document for the information about the change of mention in the applicable service manual.(Additional trouble shooting for the traction battery energy level gauge in EV-ECU/BMU of the vehicle with total 16.0kwh power is established)

## 2. Affected service manuals :

Please refer to the attached document (Attached sheet 1)

## 3. About the details :

Please refer to the attached document (Attached sheet 8-13)

Attached sheet 1

〈For overseas market〉
〈EU/MMAL/NZ〉

| Applicable manual | Pub. No. | Applicable title (INFO ID) | Contents |
|---|---|---|---|
| 2011<br>i-MiEV<br>Workshop Manual | ENG: CHAE11E1-CD<br>FRE: CHAF11E1-CD<br>GER: CHAG11E1-CD<br>SPA: CHAS11E1-CD<br>ITA: CHAI11E1-CD<br>NZ:DRAFT<br>MMAL:AU900303 | SYMPTOM CHART<br>(M549-22-250-01600-01) | Attached sheet 8 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-01400-01) | Attached sheet 9 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-02600-01) | Attached sheet 10 |
| 2012<br>i-MiEV<br>Workshop Manual | ENG: CHAE12E1-CD<br>FRE: CHAF12E1-CD<br>GER: CHAG12E1-CD<br>SPA: CHAS12E1-CD<br>ITA: CHAI12E1-CD<br>NZ:DRAFT<br>MMAL:AU900303 | SYMPTOM CHART<br>(M549-22-250-01600-01) | Attached sheet 8 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-01400-01) | Attached sheet 9 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-02600-01) | Attached sheet 10 |
| 2013<br>i-MiEV<br>Workshop Manual | ENG: CHAE13E1-CD<br>FRE: CHAF13E1-CD<br>GER: CHAG13E1-CD<br>SPA: CHAS13E1-CD<br>ITA: CHAI13E1-CD<br>NZ:DRAFT<br>MMAL:AU900303 | SYMPTOM CHART<br>(M549-22-250-01600-01) | Attached sheet 8 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-01400-01) | Attached sheet 9 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-02600-01) | Attached sheet 10 |
| 2014<br>i-MiEV<br>Workshop Manual | ENG: CHAE14E1-CD<br>FRE: CHAF14E1-CD<br>GER: CHAG14E1-CD<br>SPA: CHAS14E1-CD<br>ITA: CHAI14E1-CD<br>NZ:DRAFT<br>MMAL:AU900411 | SYMPTOM CHART<br>(M549-22-250-01600-01) | Attached sheet 8 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-01400-01) | Attached sheet 9 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-02600-01) | Attached sheet 10 |

〈MMNA〉

| Applicable manual | Pub. No. | Applicable title (INFO ID) | Contents |
|---|---|---|---|
| 2013<br>i-MiEV<br>Service Manual CD-ROM | MSCD-018B-2013 | SYMPTOM CHART<br>(M549-22-250-01600-01) | Attached sheet 11 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-01400-01) | Attached sheet 12 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-02600-01) | Attached sheet 13 |
| 2014<br>i-MiEV<br>Service Manual CD-ROM | MSCD-018B-2014 | SYMPTOM CHART<br>(M549-22-250-07200-01) | Attached sheet 11 |
| | | Inspection procedure 5: Bad mileage after<br>(M549-22-290-03600-01) | Attached sheet 12 |
| | | INSPECTION CHART FOR TROUBLE SYMPTOM<br>(M549-40-260-04800-01) | Attached sheet 13 |

Attached sheet 8

## Code No. U1921: K-line error (BMU)

**⚠ CAUTION**
**If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**

**OPERATION**
- BMU communicates with EV-ECU via CAN.

**DIAGNOSIS CODE SET CONDITIONS**
- When the diagnosis code No. U1922 is set to the BMU, the diagnosis code No. U1921 will be set.

**PROBABLE CAUSES**
- Malfunction of the BMU system

## DIAGNOSIS PROCEDURE

**STEP 1. M.U.T.-III CAN bus diagnosis**
Use the M.U.T.-III to diagnose the CAN bus lines.

**Q: Is the check result normal?**
**YES :** Go to Step 3.
**NO :** Repair the CAN bus line. (Refer to GROUP 54C – Troubleshooting .) Then go to Step 2.

**STEP 2. Diagnosis code recheck after resetting CAN bus lines**
Check again if the diagnosis code No. U1921 is set to the EV-ECU.
(1) Erase the stored diagnosis code.
(2) Set the electric motor switch from the "LOCK" (OFF) position to the "ON" position.
(3) Check if the diagnosis code is set.

**Q: Is the diagnosis code set?**
**YES :** Go to Step 3.
**NO :** This diagnosis is complete.

**STEP 3. Use M.U.T.-III to confirm a diagnosis code of other systems.**
Check if the diagnosis code No. U1922 is set to the BMU.

**Q: Is the diagnosis code set?**
**YES :** Carry out troubleshooting for the diagnosis code No. U1922. Then go to Step 4.
**NO :** Go to Step 4.

**STEP 4. Diagnosis code recheck**
Check again if the diagnosis code is set to the EV-ECU.
(1) Erase the stored diagnosis code.
(2) Set the electric motor switch from the "LOCK" (OFF) position to the "ON" position.
(3) Check if the diagnosis code is set.

**Q: Is the diagnosis code set?**
**YES :** Return to Step 1.
**NO :** The diagnosis is complete.

## TROUBLE SYMPTOM CHART

M1549222500016

| Check item | Inspection procedure | Reference page |
|---|---|---|
| EV-ECU power supply system | 1 | |
| The combination meter does not illuminate even if the electric motor switch is turned ON. | 2 | |
| The ready indicator does not illuminate even if the electric motor switch is turned to the START position. | 3 | |
| The cruising range shortened. | 4 | |
| Bad mileage | 5 | |

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| | | |
|---|---|---|
| The traction (main) battery energy level gauge does not display "Fully charged" | 6 | |

Attached sheet 9 (1/2)

**YES :** Go to Step 3.
**NO :** Check the tyre and adjust the tyre pressure.

**STEP 3. Brake drag force check**
Check the brake drag force. (Refer to GROUP 35A – On-vehicle Service .)

**Q: Is the check result normal?**
**YES :** Go to Step 4.
**NO :** Disassemble the brake caliper assembly and check for fouling and rust on the piston sliding section and deterioration of piston seal, and check the sliding status of the guide pin and lock pin. (Refer to .)

**STEP 4. Wheel alignment check**
Check the wheel alignment. (Refer to GROUP 33 – On-vehicle Service – Front Wheel Alignment Check and Adjustment , GROUP 34 – On-vehicle Service – Rear Wheel Alignment Check .)

**Q: Is the check result normal?**
**YES :** Go to Step 5.
**NO :** Adjust the wheel alignment. (Refer to GROUP 33 – On-vehicle Service – Front Wheel Alignment Check and Adjustment , GROUP 34 – On-vehicle Service – Rear Wheel Alignment Check .)

**STEP 5. Check the trouble symptom.**

**Q: Is the check result normal?**
**YES :** Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction .)
**NO :** Go to Step 1.

From attached sheet 9 (2/2)

## SERVICE DATA REFERENCE TABLE

<Added>

M1549200800064

## DATA LIST

*NOTE: VP: Indicates the brake vacuum pressure system.*

| Item No. | M.U.T.-III display | Inspection conditions | Normal conditions |
|---|---|---|---|
| 1 | Power switch signal | When the electric motor switch is in the ON position | ON |
| | | Other than above | OFF |
| 2 | Power switch (ST) signal | When the electric motor switch is in the START position | ON |
| | | Other than above | OFF |
| 3 | Brake SW | When the brake pedal is being depressed (Stop lamp switch: ON) | ON |
| | | Other than above | OFF |
| 4 | Parking brake switch | When the parking brake lever is pulled up (Parking brake switch: ON) | ON |
| | | Other than above | OFF |
| 5 | 12 V DC/DC F/B signal | • When the Ready indicator is lit<br>• When the charging indicator is lit | ON |
| | | Other than above | OFF |
| 6 | Inter lock switch | When the service plug is removed | OFF |
| | | When the service plug is installed | ON |
| 7 | Radiator fan 1 relay (diagnosis) (cooling fan LO relay) | When the radiator fan relay is operating at low speed | ON |
| | | Other than above | OFF |

To attached sheet 9 (1/2)

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**Inspection Procedure 6: The traction (main) battery energy level gauge does not display "Fully charged".**

**COMMENT ON TROUBLE SYMPTOM**

Voltage fluctuates significantly among the battery cells in the traction (main) battery.

**PROBABLE CAUSES**

- Malfunction of the traction (main) battery
- Malfunction of the EV-ECU
- Malfunction of the BMU
- Malfunction of the combination meter

## DIAGNOSIS

**STEP 1. Check whether the diagnosis code is set**

Check if the diagnosis code is set to the EV-ECU or BMU.

**Q:Is the diagnosis code set?**

**YES** : Carry out troubleshooting for the EV-ECU or the BMU.

**NO** : Go to Step 2.

**STEP 2. Check the trouble symptom for combination meter**

Carry out the trouble symptom inspection of the combination meter

**Q:Is the check result normal?**

**YES** : Go to Step 3.

**NO** : Carry out the trouble symptom inspection of the combination meter (Refer to GROUP 54A - Trouble symptom chart).

**STEP 3. Check the traction (main) battery energy level gauge**

(1)Connect the normal charging cable to charge the battery fully.

(2)Check the data list of the BMU.

- Item No. 3 : Battery cell maximum voltage

  OK: 4.080 V or more

(3)Check that the traction (main) battery energy level gauge shows F position (16th segment).

**Q:Is the check result normal?**

**YES** : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).

**NO** : Go to Step 4.

**STEP 4. Check the trouble symptom**

(1)Check the actuator test of the BMU.

- Item No. 2 : Battery balancer unit

(2)Connect the normal charging cable to charge the battery fully again.

(3)Check the data list of the BMU.

- Item No. 3 : Battery cell maximum voltage

  OK: 4.080 V or more

(4)Check that the traction (main) battery energy level gauge shows F position (16th segment).

**Q:Is the check result normal?**

**YES** : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).

**NO** : Replace the traction (main) battery.

Attached sheet 10

**STEP 2. M.U.T.-III other system diagnosis code.**

- Confirm whether the diagnosis codes are set from EV-ECU.

**Q: Is the diagnosis code set?**

**YES :** Perform the troubleshooting of the electric motor unit.

**NO :** Go to Step 3.

**STEP 3. M.U.T.-III diagnosis code**

Reconfirm whether the diagnosis codes are set from BMU.

1. Erase the diagnosis codes being set.
2. Electric motor switch: "LOCK" (OFF) → ON
3. Confirm whether the diagnosis codes are set.

**Q: Is the diagnosis code set?**

**YES :** Replace the BMU. Then go to Step 4.

**NO :** Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions ).

**STEP 4. M.U.T.-III diagnosis code**

Reconfirm whether the diagnosis codes are set from BMU.

1. Erase the diagnosis codes being set.
2. Electric motor switch: "LOCK" (OFF) → ON
3. Confirm whether the diagnosis codes are set.

**Q: Is the diagnosis code set?**

**YES :** Go to Step 1.

**NO :** Check end.

## INSPECTION CHART FOR TROUBLE SYMPTOM

M1549402600026

| Item | Trouble symptom | Inspection procedure |
|---|---|---|
| Communication with the M.U.T.-III | Communication between the M.U.T.-III and the BMU is not possible. | 1 |

## TROUBLE SYMPTOM CHART

| Inspection procedure | Check item | Reference page |
|---|---|---|
| 1 | Communication between the M.U.T.-III and the BMU is not possible. | |
| 2 | BMU power supply system | |

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|---|---|---|
| 3 | The traction (main) battery energy level gauge does not display "Fully charged" | Refer to EV-ECU |

Attached sheet 11

**STEP 4. Check whether the DTC is stored again.**
Recheck if the DTC is stored.
(1) Erase the DTC.
(2) Turn the electric motor switch from "LOCK"(OFF) position to "ON" position.
(3) Check if the DTC is stored.

**Q: Is DTC U1921 stored?**

**YES :** Return to Step 1.
**NO :** The diagnosis is complete.

## TROUBLE SYMPTOM CHART

M1549222500072

| Trouble symptoms | Inspection procedure number | Reference page |
|---|---|---|
| EV-ECU power supply system | 1 | |
| The combination meter does not illuminate even if the electric motor switch is turned ON. | 2 | |
| The ready indicator does not illuminate even if the electric motor switch is turned to the START position. | 3 | |
| The cruising range shortened. | 4 | |
| Bad mileage | 5 | |

<Added>

| | | |
|---|---|---|
| The main drive lithium-ion (traction) battery energy level gauge does not display "Fully charged" | 6 | |

Attached sheet 12 (1/2)

**STEP 2. Check the tire pressure.**
Check the tire pressure (Refer to GROUP 31 – On-vehicle Service, Tire Pressure Check .).

**Q: Is the check result normal?**

**YES :** Go to Step 3.
**NO :** Check the tire and adjust the tire pressure.

**STEP 3. Brake drag force check**
Check the brake drag force (Refer to GROUP 35A – On-vehicle Service, Brake Drag Force Check .).

**Q: Is the check result normal?**

**YES :** Go to Step 4.
**NO :** Disassemble the brake caliper assembly and check for fouling and rust on the piston sliding section and deterioration of piston seal, and check the sliding status of the guide pin and lock pin (Refer to GROUP 35A – Front Disc Brake Assembly .).

**STEP 4. Wheel alignment check**
Check the wheel alignment (Refer to GROUP 33 – On-vehicle Service, Front Wheel Alignment Check and Adjustment , GROUP 34 – On-vehicle Service, Rear Wheel Alignment Check .).

**Q: Is the check result normal?**

**YES :** Go to Step 5.
**NO :** Adjust the wheel alignment (Refer to GROUP 33 – On-vehicle Service, Front Wheel Alignment Check and Adjustment , GROUP 34 – On-vehicle Service, Rear Wheel Alignment Check .).

**STEP 5. Check the trouble symptom.**

**Q: Is the check result normal?**

**YES :** Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, How to Cope with Intermittent Malfunctions .).
**NO :** Go to Step 1.

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From attached sheet 12 (2/2)

## SERVICE DATA REFERENCE TABLE

M1549200800031

### DATA LIST

*NOTE: VP: Indicates the brake vacuum pressure system.*

| Item No. | Check item | Check conditions | Normal conditions |
|---|---|---|---|
| 1 | Power switch signal | When the electric motor switch is in the ON position | ON |
| | | Other than above | OFF |
| 2 | Power switch (ST) signal | When the electric motor switch is in the START position | ON |
| | | Other than above | OFF |



TSB Revision

To attached sheet 12 (1/2)

<Added>

**Inspection Procedure 6: The main drive lithium-ion (traction) battery energy level gauge does not display "Fully charged".**

**COMMENT ON TROUBLE SYMPTOM**

Voltage fluctuates significantly among the battery cells in the main drive lithium-ion (traction) battery.

**PROBABLE CAUSES**

- Malfunction of the main drive lithium-ion (traction) battery
- Malfunction of the EV-ECU
- Malfunction of the BMU
- Malfunction of the combination meter

## DIAGNOSIS

**STEP 1. Check whether the diagnosis code is set**

Check if the DTC is set to the EV-ECU or BMU.

**Q:Is the DTC set?**

**YES** : Carry out troubleshooting for the EV-ECU or the BMU.

**NO** : Go to Step 2.

**STEP 2. Check the trouble symptom for combination meter**

Carry out the trouble symptom inspection of the combination meter

**Q:Is the check result normal?**

**YES** : Go to Step 3.

**NO** : Carry out the trouble symptom inspection of the combination meter (Refer to GROUP 54A - Trouble symptom chart).

**STEP 3. Check the main drive lithium-ion (traction) battery energy level gauge**

(1)Connect the normal charging cable to charge the battery fully.

(2)Check the data list of the BMU.

- Item No. 3 : Battery cell maximum voltage
  OK: 4.080 V or more

(3)Check that the main drive lithium-ion (traction) battery energy level gauge shows F position (16th segment).

**Q:Is the check result normal?**

**YES** : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).

**NO** : Go to Step 4.

**STEP 4. Check the trouble symptom**

(1)Check the actuator test of the BMU.

- Item No. 2 : Battery balancer unit

(2)Connect the normal charging cable to charge the battery fully again.

(3)Check the data list of the BMU.

- Item No. 3 : Battery cell maximum voltage
  OK: 4.080 V or more

(4)Check that the main drive lithium-ion (traction) battery energy level gauge shows F position (16th segment).

**Q:Is the check result normal?**

**YES** : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).

**NO** : Replace the main drive lithium-ion (traction) battery.

Attached sheet 13

**STEP 2. Scan tool MB991958 other system diagnostic trouble code.**

- Confirm whether the diagnostic trouble codes are set from EV-ECU.

**Q: Is the diagnostic trouble code set?**

**YES :** Perform the troubleshooting of the electric motor unit .

**NO :** Go to Step 3.

**STEP 3. Scan tool MB991958 diagnostic trouble code**

Reconfirm whether the diagnostic trouble codes are set from BMU.

1. Erase the diagnostic trouble codes being set.
2. Electric motor switch: "LOCK" (OFF) → ON
3. Confirm whether the diagnostic trouble codes are set.

**Q: Is the diagnostic trouble code set?**

**YES :** Replace the BMU. Then go to Step 4.

**NO :** Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions ).

**STEP 4. Scan tool MB991958 diagnostic trouble code**

Reconfirm whether the diagnostic trouble codes are set from BMU.

1. Erase the diagnostic trouble codes being set.
2. Electric motor switch: "LOCK" (OFF) → ON
3. Confirm whether the diagnostic trouble codes are set.

**Q: Is the diagnostic trouble code set?**

**YES :** Go to Step 1.

**NO :** Check end.

## INSPECTION CHART FOR TROUBLE SYMPTOM

M1549402600048

| Item | Trouble symptom | Inspection procedure |
|---|---|---|
| Communication with the scan tool MB991958 | Communication between the scan tool MB991958 and the BMU is not possible. | 1 |

## TROUBLE SYMPTOM CHART

| Inspection procedure | Check item | Reference page |
|---|---|---|
| 1 | Communication between the scan tool MB991958 and the BMU is not possible. | |
| 2 | BMU power supply system | |

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|---|---|---|
| 3 | The main drive lithium-ion (traction) battery energy level gauge does not display "Fully charged" | Refer to EV-ECU |